

**We claim:**

1. A process for obtaining a pure aliphatic dialdehyde monoacetal by reaction of the corresponding aliphatic dialdehyde or a precursor of the corresponding aliphatic dialdehyde with one or more aliphatic mono- or polyhydric alcohols while distillatively removing water to obtain a reaction mixture which is separated distillatively, which comprises carrying out the distillative separation continuously in a dividing wall column to obtain pure aliphatic dialdehyde monoacetal as a sidestream from the dividing wall column, or in two distillation columns to obtain crude aliphatic dialdehyde monoacetal as a sidestream in the first distillation column, feed the crude aliphatic dialdehyde monoacetal to the second distillation column and obtain pure aliphatic dialdehyde monoacetal as the sidestream from the second distillation column.
- 15 2. A process as claimed in claim 1, wherein the reaction mixture is heated to from 80 to 130°C before the distillative separation.
- 20 3. A process as claimed in either of claims 1 or 2, wherein the reaction mixture is heated for at least 15 minutes, preferably from 30 minutes to 4 hours, more preferably for 1 hour, preferably at from 90 to 110°C.
- 25 4. A process as claimed in any of claims 1 to 3, wherein the aliphatic dialdehyde is a substance from the following list: malonaldehyde, succinaldehyde, glutaraldehyde or adipaldehyde.
- 30 5. A process as claimed in claim 4, wherein the aliphatic dialdehyde used is glutaraldehyde, preferably in aqueous solution, more preferably as a 50% by weight aqueous solution, or its precursor 2-hydroxy-3,4-dihydro-2H-pyran.
6. A process as claimed in any of claims 1 to 5, wherein the aliphatic mono- or polyhydric alcohol is a diol, in particular ethylene glycol, 1,2-propylene glycol, 1,3-propylene glycol, 1,2-butanediol, 1,3-butanediol or 1,4-butanediol, more preferably ethylene glycol.

7. A process as claimed in claim 5 or 6, wherein glutaraldehyde is reacted with ethylene glycol in a molar ratio in the range from 1:1.5 to 1.5:1, preferably from 1:1.2 to 1.2:1, more preferably of 1.0:1.0.
- 5 8. A process as claimed in any of claims 1 to 7, wherein the reaction is carried out in the presence of an acidic catalyst, in particular of a cation exchanger, of a mineral acid, preferably sulfuric acid, hydrochloric acid, more preferably orthophosphoric acid, or an organic acid, in particular acetic acid, p-toluenesulfonic acid or methanesulfonic acid, in a concentration of from 0.02 to 5% by weight, preferably from 0.1 to 1% by weight, more preferably of 0.3% by weight, based on the total weight of the reaction mixture.
- 10 9. A process as claimed in any of claims 1 to 8, wherein the optionally heated reaction mixture is continuously separated in two distillation columns to remove the crude aliphatic dialdehyde monoacetal as a sidestream in a first distillation column and the pure aliphatic dialdehyde monoacetal as a sidestream in a second distillation column.
- 15 10. A process as claimed in any of claims 1 to 8, wherein the optionally heated reaction mixture is separated in a dividing wall column having a vertical dividing wall which is disposed in the longitudinal direction of the column and divides the column into a feed region, a takeoff region, a lower combined column region and also an upper combined column region, to recover pure aliphatic dialdehyde monoacetal as a sidestream from the withdrawal region.
- 20 11. A process as claimed in any of claims 1 to 10, wherein the distillative separation of the optionally heated reaction mixture is carried out with the addition of a high-boiling diluent in the lower region of the first distillation column or in the upper combined column region of the dividing wall column.
- 25 12. A process as claimed in claim 11, wherein the high-boiling diluent is a substance or a mixture of substances selected from the following listed groups: alkanes, aromatics or polyethers, preferably polypropylene glycols or polyethylene glycols, more preferably polyethylene glycol having an average molecular mass of 300.
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